

# Health Analytics: From Data to Decision Making

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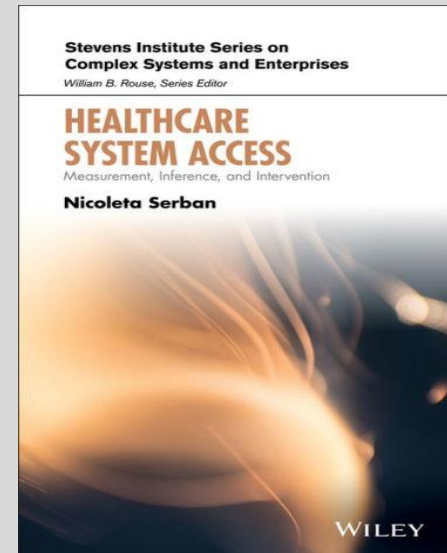
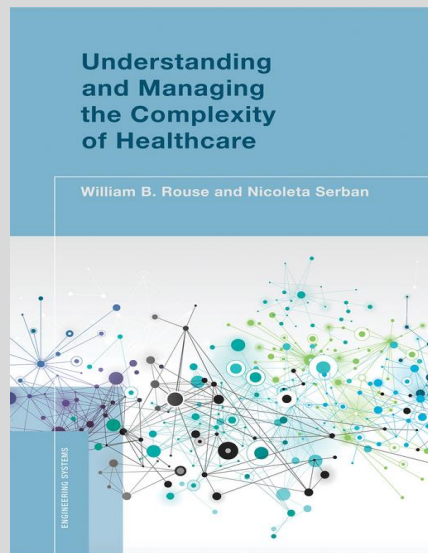
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Virginia C. Joseph C. Mello Professor  
Industrial and Systems Engineering  
Georgia Institute of Technology

- 65+ journal articles & 100+ presentations/seminars
- Panel Reviewer for NSF, NIH, PCORI
- Participated in Frontiers Symposiums and Workshops, National Academies of the United States
- \$3.2 million in funding as Principal Investigator

*My favorite quote, a well-worn slogan “in God we trust—all others bring data.”*



# Health Analytics at Georgia Tech

**Georgia Tech**

**Health Analytics**  
Stewart School of Industrial & Systems Engineering

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## Georgia Map Visualization

In collaboration with [Healthcare Georgia Foundation](#), we have developed a Data Web Portal for disseminating comprehensive healthcare measures available at the community level in Georgia. The objective is towards supporting The Two Georgias Initiative, a place-based rural grantmaking program. This Initiative is designed to eliminate health disparities and achieve greater health equity among the state's rural Georgians.

[View Data Web Portal >>](#)

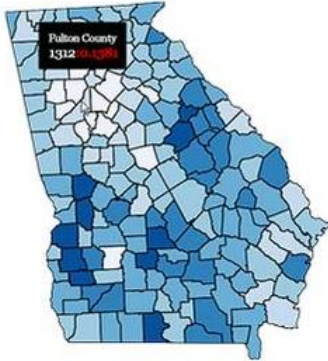
Category of Measures - **Step 1**

Disease Prevalence

Measure

Adult Diabetes - Medicaid

Counties



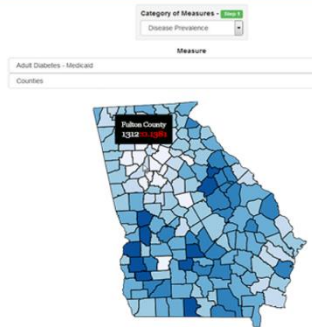
## HEALTH ANALYTICS @ GEORGIA TECH

Health Analytics at Georgia Tech bridges fundamental mathematical and computational modeling with health services research and health economics as a means of translating health and healthcare data into knowledge and decision making.

# Web Data Portals

## Georgia Healthcare Measures and Determinants Data Portal

In collaboration with [Healthcare Georgia Foundation](#), we have developed a Data Web Portal for disseminating comprehensive healthcare measures and health determinants available at the community level in Georgia. The objective is towards supporting The Two Georgias Initiative, a place-based rural grantmaking program.

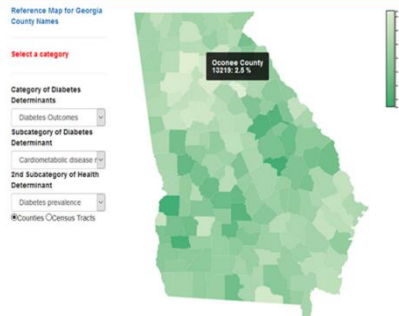


[View Data Visualization](#)

Georgia Data Portal:  
Healthcare Measures and  
Health Determinants

## Georgia Diabetes Data Portal

In collaboration with the [Georgia Center for Diabetes Translation Research](#) and Emory University, we have developed a Data Web Portal for disseminating localized health and healthcare indicators relevant to addressing the needs of the population with diabetes in Georgia.

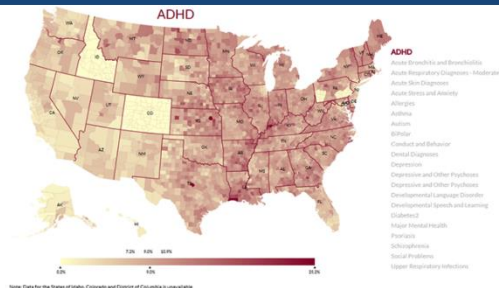


[View Data Visualization](#)

Georgia Diabetes Data  
Portal: Healthcare  
Measures & Health  
Determinants

## In-treatment Prevalence Data Portal

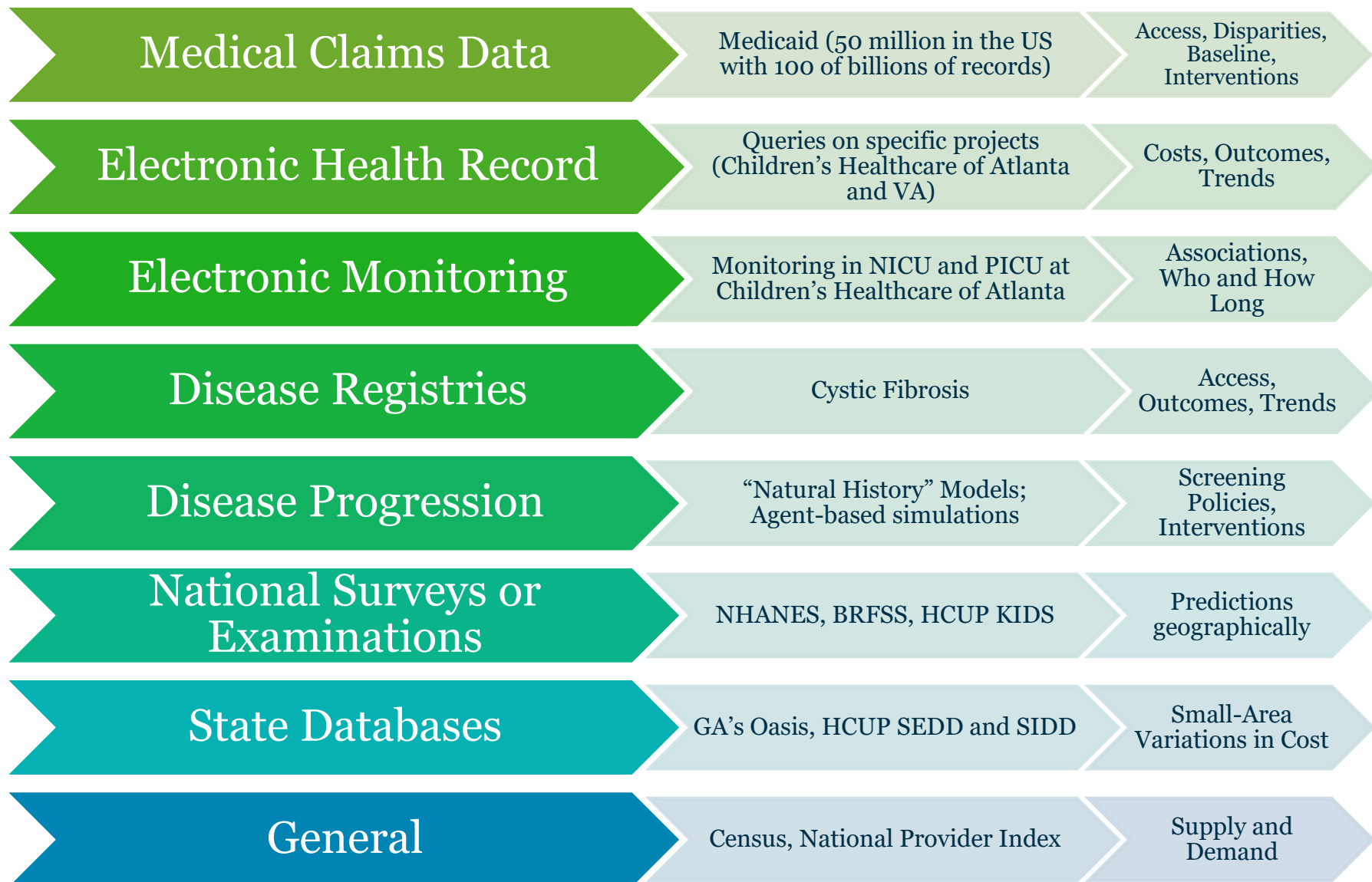
This data portal disseminates in-treatment prevalence of multiple conditions for Medicaid-enrolled children. *In-treatment prevalence* is defined as the percentage of children in a community that are diagnosed and treated for the condition; it does not include children who are not diagnosed or/and not treated. The prevalence was derived from the 2012 Medicaid Analytical eXtract (MAX) claims data. The data portal was developed with the support of Madhu Babu Adiki, MS student in the Analytics program.



[View Data Visualization](#)

Medicaid Disease  
Prevalence: All States

# Data Sources & Data Complexity



# Mental & Behavioral Healthcare System Analysis



# Objectives

1. Locate the supply of mental health services
2. Estimate access to mental health services
  - Identify underserved communities
3. Evaluate impact of potential interventions to improve access to care

# Available Data Sources

- National Plan and Provider Enumeration System
  - Provider name, specialty, and practice location for every NPI
- Secretary of State Licensure Roster
  - Name and mailing address for every psychiatric nurse, professional counselor, clinical social worker, marriage and family therapist, and psychologist license holder
- Medicaid Claims Data
  - Procedure codes, service provider, and modality for every Medicaid claim submitted for reimbursement
  - Demographics, zip code, diagnosis codes and payments for every Medicaid beneficiary
  - Years available for Georgia: **2005-2016**



# Additional Data Sources

- DBHDD

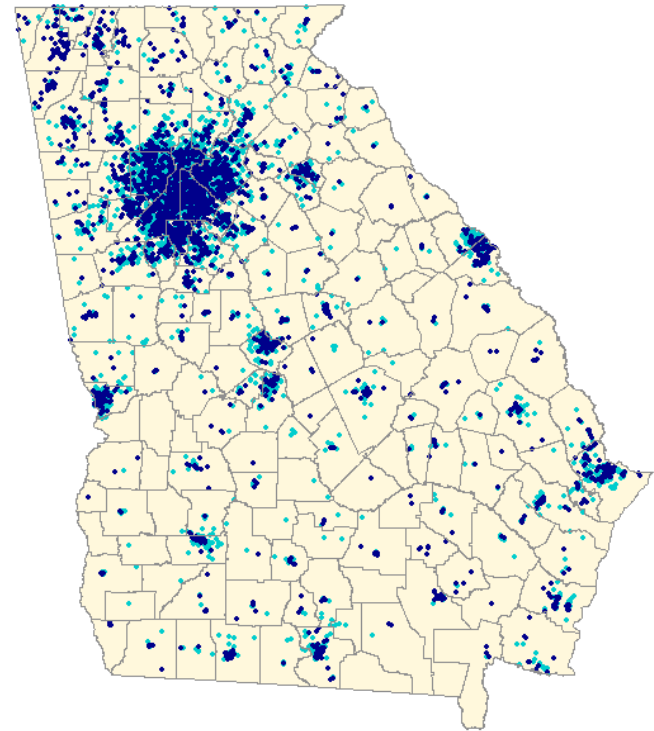
- Number of children treated, and services performed through the APEX program for every participating school and provider organization
- Number of children treated, and services performed by provider or organization

- DCH

- Number of Medicaid enrollees seen by providers with mental/behavioral services in the Georgia Families 360 Program
- Services provided to children on Medicaid/CHIP

# Service Availability by Provider

- Identify and locate all mental health providers in Georgia
- Identify providers participating in state-funded programs
- Estimate availability in terms psychosocial services at each location (by provider)
- Estimate availability in terms of modalities of care at each location (by provider)



# Public/State-funded Healthcare Delivery

## Department of Behavioral Health and Developmental Disabilities (DBHDD)

### SSI Medicaid

- Children with mental health challenges
- Children with intellectual or developmental disabilities

### Uninsured

- Children not insured in a public insurance program or commercial insurance with MH services

## Department of Community Health (DCH)

### Medicaid

- Low-income children

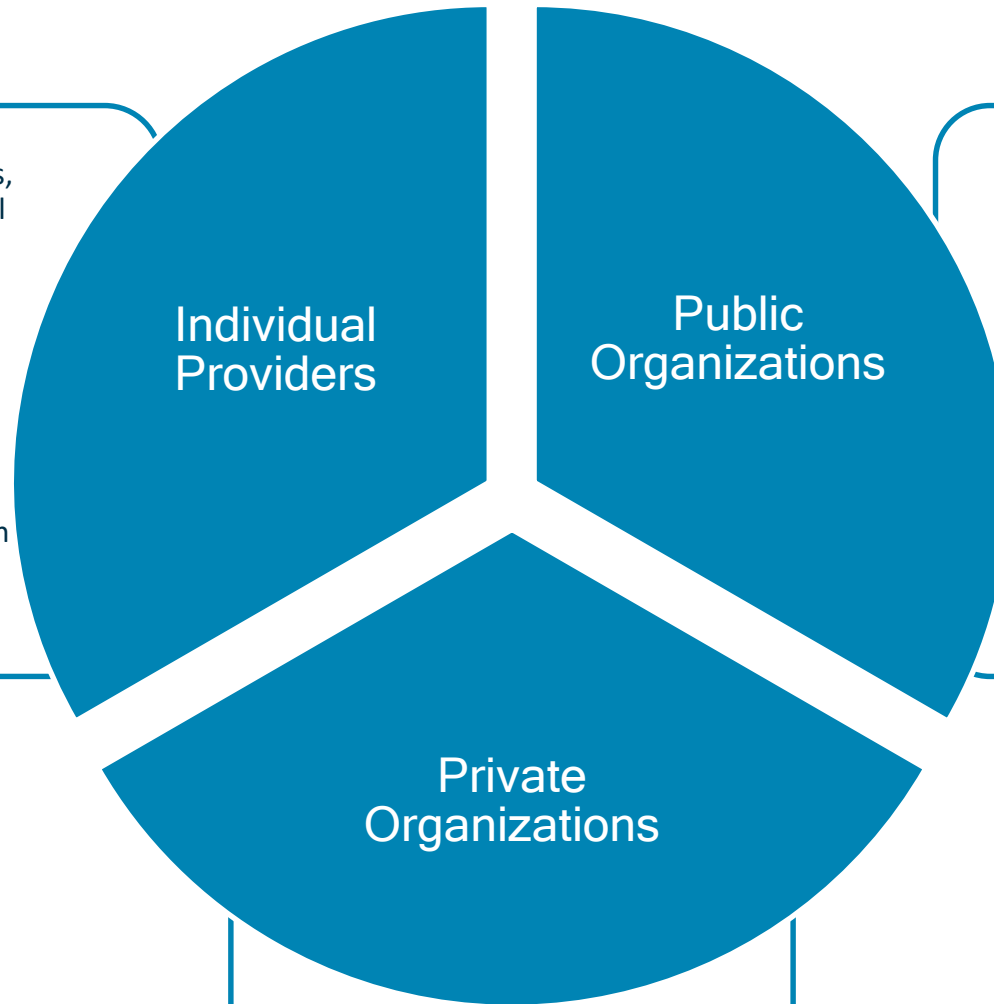
### PeachCare for Kids

- Low-income children not eligible for Medicaid

### Georgia Families 360

- Children in foster care
- Children receiving adoption assistance
- Children in juvenile justice system

# Workforce for Mental Healthcare Delivery



- Include psychiatric nurses, psychiatrists, professional counselors, clinical social workers, marriage and family therapists, and psychologists
- Nurses practice under supervision; others can practice independently depending on license
- Some require certification but not licensure (peer specialists, addiction counselors, etc.)

- Include community service boards (CSBs) contracted by DBHDD
- Primarily treat uninsured and publicly-insured.
- Some CSBs also accept commercial insurance

- May market themselves as a Medicaid providers and may contract with DBHDD to provide community care

# Modality for Outpatient Mental Healthcare

## In school

- Includes APEX program and older school programs

## In home

- Provided more by private organizations than by community service boards

## In clinic

- May be inpatient or outpatient

## Telehealth

- For some services, may be utilized only when delivering the service to an individual for whom English is not their first language

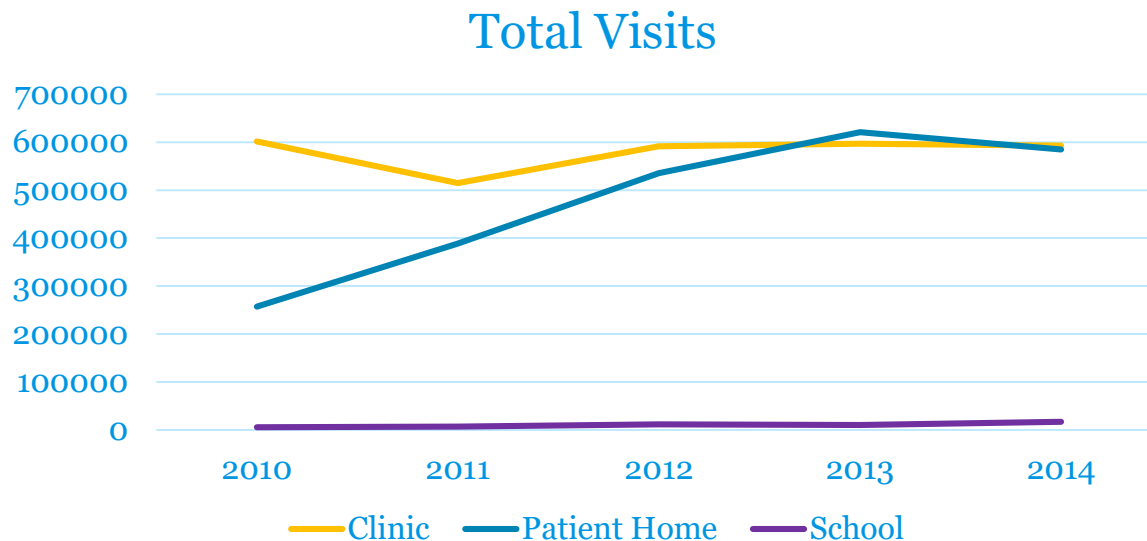
# Challenges in Assessing Availability

## 1. Data on provider-level availability by:

- Modality of care
- Taxonomy of care

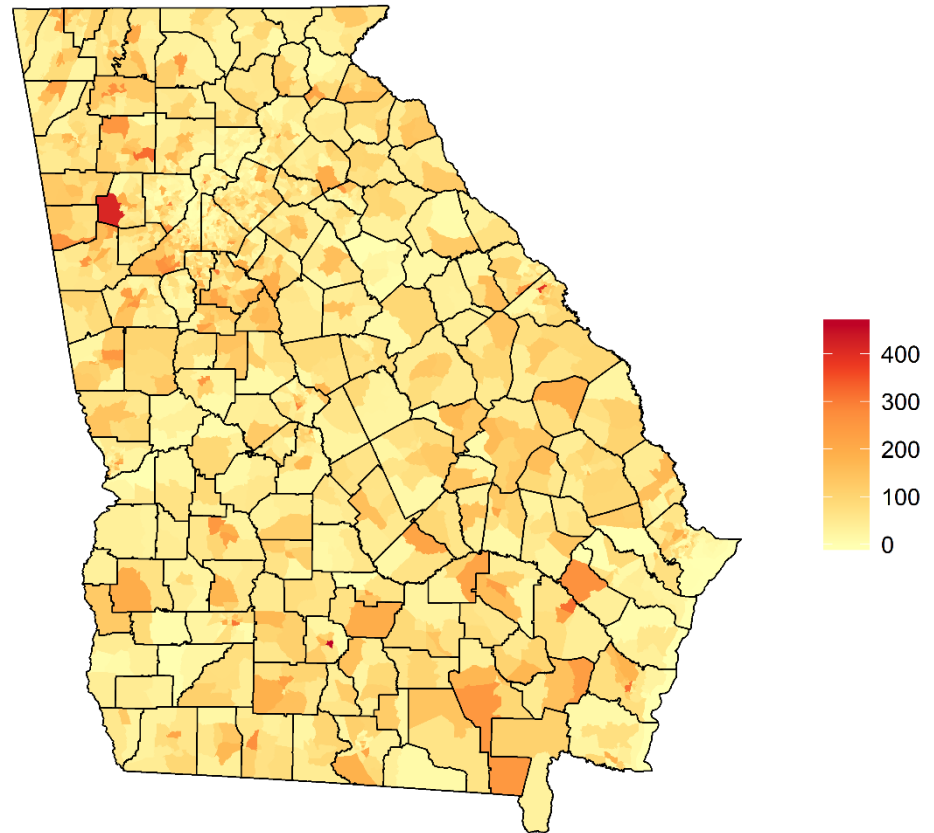
## 2. Policies on

- Reimbursement by service and provider type
- Scope of practice and independence practice



# Demand for MH services

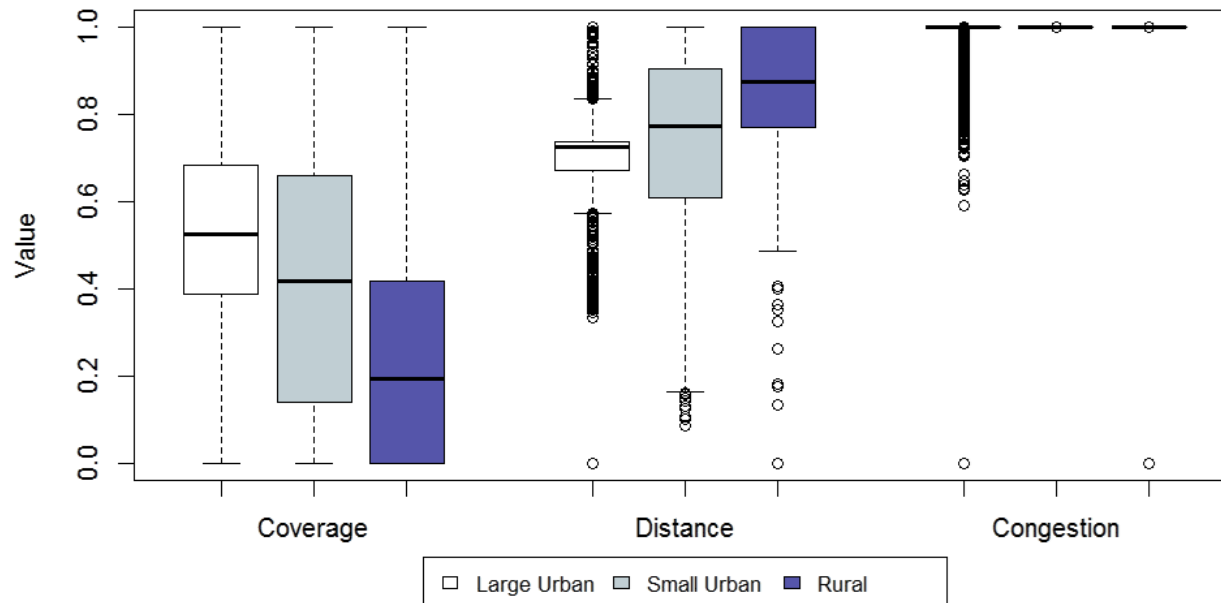
- Obtain number of enrollees on state-funded programs using data from Census Bureau, CMS, DCH and DBHDD
- Estimate census tract-level prevalence of treated mental health conditions using Medicaid claims data
- The number of psychosocial visits received by child or adult with different mental health conditions





# Access to MH Services

- Use optimization models to match supply with demand and compute census tract-level
  - Met demand (coverage)
  - Provider congestion
  - Patient travel distance



# Policy Lab: Assess Interventions

- Policy Change
  - Expand loan forgiveness programs
  - Reduce reimbursement restrictions
  - Reimbursement parity
- Reduce travel distance
  - Remove telehealth restrictions
  - Increase community-based care

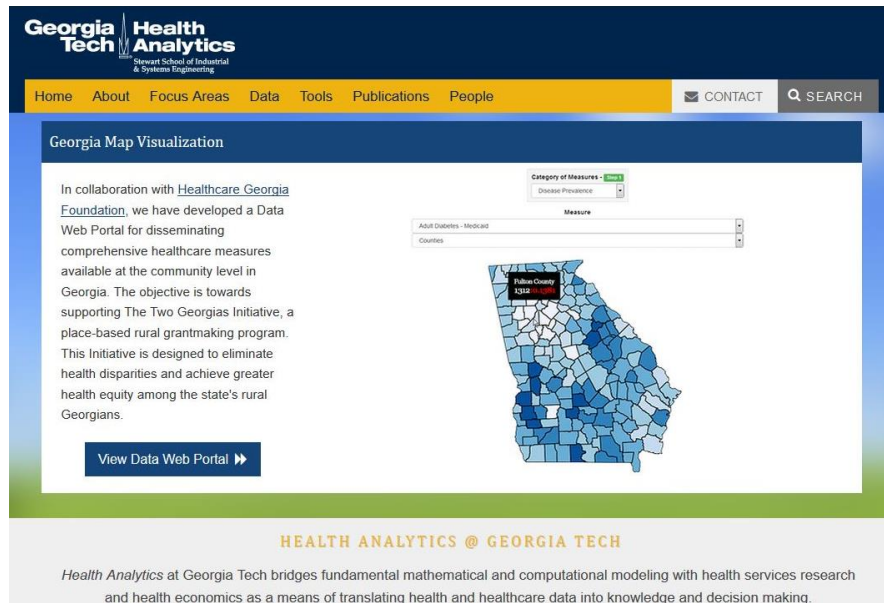


# Contact

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<http://healthanalytics.gatech.edu>

A screenshot of the Georgia Health Analytics website. The header is dark blue with the 'Georgia Tech Health Analytics' logo and navigation links: Home, About, Focus Areas, Data, Tools, Publications, People, CONTACT, and SEARCH. The main content area has a blue header 'Georgia Map Visualization'. Below this, there is a text block on the left and a map of Georgia on the right. The text block describes a collaboration with the Healthcare Georgia Foundation to develop a Data Web Portal for disseminating comprehensive healthcare measures available at the community level in Georgia. The map shows various counties in Georgia, with some highlighted in blue. A legend on the right side of the map shows 'Category of Measure' with a dropdown menu set to 'Diabetes Prevalence' and a 'Measure' dropdown set to 'Adult Diabetes - Medicaid'. A 'View Data Web Portal' button is located at the bottom left of the map area. The footer is light gray and contains the text 'HEALTH ANALYTICS @ GEORGIA TECH' and a paragraph about the school's mission in health services research and health economics.